United States Department of the Interior

FISH AND WILDLIFE SERVICE

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Ms. Stephanie Stirling
U.S. Army Corps of Engineers
Seattle District (OD-TS)
P.O. Box 3755
Seattle, Washington 98124

Dear Ms. Stirling:

The Fish and Wildlife Service (Service) appreciates the opportunity to comment on the draft Interim Final *Northwest Regional Sediment Evaluation Framework* (SEF) dated September 2006. The Service believes the interim framework needs to be revised to address several critical issues discussed in recent meetings because concerns that the Service and other agencies have documented on previous drafts have not yet been resolved. These critical issues relate to 1) the required bioassay tests such as inclusion of a freshwater chronic bioassay; 2) the dredged material management units (DMMUs), including revising the number of samples required per DMMU, revising the exclusionary rank and no test volume estimates, and further addressing grain size exclusions; 3) the use of the floating percentile method for freshwater screening values prior to their validation; and 4) resolving remaining bioaccumulation issues such as appropriate use of Toxic Equivalency Factors. The Service will use and promote the use of the Interim Final SEF with the following caveats:

1) The Service may request a greater sampling intensity than that proposed as a minimum in the SEF.

2) The Service will consider additional lines of evidence prior to assigning a rank that requires reduced testing for an area. The additional evidence lines include historic contaminant data, proximity to contaminant sources, river hydrodynamics, source of material proposed for dredging, erosional or depositional status of material, total organic carbon (TOC) and grain size.

3) The Service may request chemical analysis or further evaluation of sandy materials with less than 0.5 percent TOC and greater than 80 percent grain in some situations where a contaminant source is suspected.

4) The Service will not use the proposed sediment quality guidelines as the primary line of evidence for triggering further evaluation, but will incorporate threshold effects levels and probable effects levels, as well as other values more specific to fish, as lines of evidence to assess the potential for dredged material to impact the aquatic community

5) The Service will use the Oregon Department of Environmental Quality's guidance for bioaccumulative contaminants to assist in the interpretation of bioaccumulative chemicals detected and in the assessment of potential effects of dredging and disposal to higher level receptors.

Specific comments regarding these and other issues, along with recommendations to resolve these issues, are provided below.

Chapter 1. No further comments.

Chapter 2.

Section 2.2. Add a brief description of the Fish and Wildlife Coordination Act. This request was initially given on the earlier draft of the Sediment Evaluation Framework (SEF), and the response to comments on that earlier draft indicated language was added, but this language is not in the current document. We recommend adding the following language under section 2.2:

"Fish and Wildlife Coordination Act of 1934, as amended.
The Act provides that whenever the waters or channel of a body of water are modified by a department or agency of the United States, the department or agency first shall consult with the U.S. Fish and Wildlife Service and with the head of the agency exercising administration over the wildlife resources of the state where construction will occur, with a view to the conservation of wildlife resources. The Act provides that land, water and interests may be acquired by federal construction agencies for wildlife conservation and development. In addition, real property under jurisdiction or control of a federal agency and no longer required by that agency can be utilized for wildlife conservation by the state agency exercising administration over wildlife resources upon that property. The Act's purposes are to recognize the vital contribution of our wildlife resources to the nation, and their increasing public interest and significance, and to provide that wildlife conservation receive equal consideration and be coordinated with other features of water-resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation."

Chapter 3.

Figure 3-1. Replace the text in the box that states "Receive biological opinion from NMFS/USFWS" with "Receive concurrence letter or biological opinion from NMFS/USFWS."

Page 3-7. Delete the sentences "Neither the Biological Opinion from NMFS or USFWS, nor the state water quality certifications are issued for 10 years. These will need to be renewed during the life of the permit." Replace with "However, the state water quality certification is not issued for 10 years and the project may need recertification. In addition, endangered species consultation will need to be reinitiated within the 10-year period for any activity that was not considered in the original consultation."

Page 3-8, number 4. Delete all sentences and replace with the following: "If threatened or endangered species are known or suspected in the project area, a biological assessment for the project will be prepared." Contrary to what is stated in the document, there are no activities currently covered in an existing biological opinion with the Service, and therefore an applicant should not be directed to check for an existing biological opinion. Revision of language in number 4 was requested in the earlier draft by both the Service and the National Marine Fisheries Service.

Chapter 4.

Figure 4-1. Check the boxes under the columns "ESA species" and "Critical Habitat" for the rows headed by "New Exposed Surface" and "Open Water Disposal" (across from both the "settled sediment" and "water column" boxes) as ESA species and Critical Habitat are potential receptors for these pathways. These boxes should also be checked in Figure 4-2. It is unclear why the fish and birds/mammals boxes would be checked and identified as receptors but not the ESA species and habitat boxes.

Figure 4-1, under "Transport Processes (Examples)." The information below this heading states that bioaccumulation is a transport process not addressed in the SEF. However, we are addressing bioaccumulation as a pathway (as indicated in Figures 4-1 and 4-2) and essentially as a transport process, so we recommend deleting the word bioaccumulation in this case.

Figure 4-3. Change "Compare Existing Data to Screening Guidelines" in the second box to "Compare Existing Data to Screening Guidelines, Bioaccumulation Triggers, or Reference Values" as screening guidelines are just one small part of the Screening Assessment in Level I. Also, in Figure 4-6 add "Bioaccumulation data" to the "Review Existing Information" box as part of the Level I task, and this information should be added as part of the Conceptual Site Model in section 4.4.1 as well. It should be clearer in this section that acquiring existing bioaccumulation data and screening for bioaccumulative chemicals are level 1 tasks; screening only for sediment quality values (SQV) or obtaining history on only chemicals with SQVs is not sufficient.

Section 4.2.3. It is good to see that the bullet was added stating "Ensuring the dredging process itself will not result in unacceptable impacts to the environment and the dredging site." The Service interprets this statement to also include the potential impacts from bioaccumulative contaminants. However, the response to comments from the previous draft SEF indicates that the U.S. Army Corps of Engineers (COE) does not consider that bioaccumulative contaminants need to be addressed at the dredging site. Specifically, the COE's response states "Do not agree that there is significant exposure time from resuspension or that the residuals will pose bioaccumulative threat. These should be dealt with in remedial design." This response is in conflict with language in the document under Section 11.4 that states that "Dredging residuals, on the other hand, may contribute to long-term bioaccumulation risk if CSs [contaminated sediments] are resuspended during dredging and redeposited on the surface of the project area where they may continue to be exposed to the aquatic community after the construction work is completed." There seems to be a fundamental disagreement between the agencies and the COE (or internally within the COE), and this should be further discussed and resolved, or specific citations added that support the COE's contention regarding bioaccumulation potential at dredge sites. Also, the fourth bullet should be modified to state "Ensuring dredging and disposal

activities will not expose ROCs [receptors of concern] to contaminants at concentrations that will cause adverse effects or increase availability of bioaccumulative contaminants; and . . . ."

Chapter 5.

Section 5.3. Site ranking. The Service recommends deleting or revising the system of ranking, especially the exclusionary ranking, as it leads to confusion because nearly all sites have to be tested and evaluated at some point. Some areas proposed to be dredged can be evaluated and excluded from further characterization using sediment quality guidelines based on 1) results from previous chemical testing; 2) location in non-depositional or erosional areas and where other methods such as testing biofilms are more predictive and reliable than sediment quality standards if testing is deemed necessary (Wenning and Ingersoll 2002); or 3) results indicating the area has low amounts of fine grain material, total organic carbon less than 0.5 percent, and no nearby contaminant source. It should be noted that although sites may be excluded from further characterization using sediment quality guidelines, the site may be subject to other types of characterization such as bioaccumulation analysis, biofilm analysis, dredged elutriate testing, or chemical characterization of only the fine-grained material. Erosional and larger-grained sites that can consistently be excluded from further characterization using sediment quality guidelines, bioaccumulation analysis, or other methods can be agreed to by all agencies and listed in the document as sites with no further sediment characterization required.

Section 5.3. The second bullet in this section should be revised to state "Historical data review and proximity to known sources of contamination." In addition, this bullet should be listed as the first item considered by an applicant. To date, many applicants first look at whether or not their material may by excluded, rather than first looking at the historical data and proximity to contaminants (which is the first step identified earlier in the document). The SEF should specifically state this process in section 5 as it does correctly in previous sections.

Table 5-1. As mentioned above, the Service recommends deleting or revising this table because the term "Exclusionary" ranking is confusing and implies that no testing is needed, when in reality testing has already been done in the area. At a minimum, the ranking should be changed to "Exclusion from further testing" or "No Further Characterization" to more accurately represent the dredge process and to prevent confusion for dredge applicants.

Section 5.3.1. Delete the first sentence "To assign initial rankings, RSET [Regional Sediment Evaluation Team] relied on best professional judgment of Corps [U.S. Army Corps of Engineers] and EPA [U.S. Environmental Protection Agency] representatives who have been working and evaluating sediment quality data in the region." Best professional judgment indicates to the reader that all the signatories of the document agreed on the statements supported by best professional judgment, which is not the case. As stated by the Service at the first meeting of the RSET committee, and in the Service's written comments on the previous draft SEF, references to "program experience" and "best professional judgment" need to be replaced by literature citations supporting the position described. These terms should be removed from the document unless all signatories agree a particular statement represents their agency's position. In this particular case, the term implies that best professional judgment was the only guidance used to rank areas when, in reality, those areas initially were tested and reviewed as described later in section 5.9.1 (which could be referred to here). Therefore, this sentence should be revised to indicate that ranking was based on previous testing (and based on the hydrodynamic and

erosional/depositional aspects of the river) and therefore data were reviewed to make ranking decisions.
Section 5.3.2. Change third sentence to "They may be excluded from further testing because they are frequently dredged and have two rounds of successive evaluation where no CoCs have been shown, and no new sources of contaminants are suspected or documented (Section 5.7)." This revision will be more consistent with earlier sections of the document.

Section 5.4. The minimum number of samples to characterize any DMMUs should be three in order to properly assess variation in sediment characteristics. This would not be burdensome on an applicant because the collection crew is already mobilized, and often only total organic carbon (TOC) and grain size is analyzed from the samples. Using only one sample to characterize a DMMU is not acceptable.

Section 5.9.3. As stated in earlier comments, the Service cannot agree to allowing exceptions for small projects and establishing no test volumes in areas where listed species occur. This issue must be resolved with a solution that is protective of listed species before the Service can agree that the SEF is useable.

Chapter 6.

Page 6-5, second bullet. Insert "at" between "collected" and "the."

Chapter 7.

Table 7-1. Identify the source of all guideline numbers in the table, and insert the definitions for "SL1" and "SL2" as a footnote in the table. The table should stand alone, and the terms are not defined even in the text prior to introducing the table. Also, the unit labeling is confusing; the units for PAHs and other organics are µg/kg, but the units for organic carbon (OC) normalized data are mg/kg-OC. Unit consistency in the tables would be helpful and more appropriate.

Table 7-1. Provide the equation used to normalize for OC in footnote 2, as it is confusing to readers what value was used (typically a value of 1 percent is common but that is not clear here). A discussion should be added to the text as to why the marine values were carbon normalized but not the freshwater values.

Table 7-1. Many of the SL1 and SL2 values in the table for marine and freshwater systems are 2 to 10 times higher than other comparable benchmark values for sediment (e.g., lead, copper, polyaromatic hydrocarbons [PAHs]). The Service is concerned that these sediment values will not reliably protect benthic species. In particular, the freshwater screening values (calculated using the floating percentile method [FPM]) are derived from a limited data set from the Northwest that has not been verified, and may not be protective of some aquatic organisms. This is especially true of the screening levels for PAHs based on the FPM, which are many times higher than other screening guidelines and exceed values recommended by the National Oceanic and Atmospheric Administration (NOAA) for protection of benthic fish (Johnson et al. 2002). The data used to calculate the PAH values based on the FPM may have included samples of pencil pitch, tar balls, or other forms of PAHs that are not readily bioavailable to organisms and do not result in predictable sediment quality guidelines (Wenning and Ingersoll 2002). The Service does not believe that the RSET should use the FPM values as a test case in this document during the interim period that the manual will be in use. Rather, we recommend that the

threshold effects level and probable effect level values be used until the reliability of the FPM values can be verified and more data sets can be included in the FPM calculations.
Section 7.4. The second paragraph indicates that "Sediments with TOC contents less than 0.5 percent have a high probability of no adverse effects in bioassay tests, with the exception of certain watersheds . . . ." This means that sediments will generally be excluded from further testing if TOC is less than 0.5 percent and grain size is less than 20 percent fines. However, this exclusion is based on the results of bioassay tests (sediment less than 0.5 percent TOC does not result in a reasonable prediction of toxicity) and does not include bioaccumulation. Therefore, sediment with less than 0.5 percent TOC could contain bioaccumulative compounds that become more available as sediments are disturbed during dredging. It should be mentioned in the text that in some cases testing for bioaccumulative compounds will be required even when TOC is less than 0.5 percent. In some instances it may be more meaningful to test only the fine material for detectable concentrations of bioaccumulative chemicals and other compounds. Information in this section should be provided earlier or referred to in Section 5.4.

Section 7.7.4, page 7-16, second paragraph. Contrary to what is indicated here, Toxicity Equivalent Factors (TEFs) for dioxins, furans, and planar PCBs should be used to calculate a toxic equivalent (TEQ) value when congener-specific data are available, which is the preferred position by EPA (2003). Mammalian and avian TEFs have been used in risk assessment since the 1990s, and this paragraph should be rewritten to state that assessing dioxin-like toxicity based on summation of TEFs should be the preferred method for risk assessment, as a number of threshold effects level values exist for species based on TEQs. The only exception would be for fish-based TEFs, which could require more validation prior to use. The appropriate, updated TEFs to use for mammals can be found in van den Berg et al. (2006). TEFs for birds and fish can be found in van den Berg et al. (1998).

Chapter 8.

Section 8.2.2. Chronic freshwater tests should be required for freshwater bioassays, as they are for marine bioassays. Otherwise, sensitive freshwater prey organisms for listed species may not be protected.

Section 8.2.4. Justification should be given as to why the alpha level for statistical significance is set at 0.05. For bioassay tests, the Service recommends 0.01.

Chapter 9.

Page 9-5, last sentence. Change sentence to read "Finally, if the project design would reduce concentrations of bioaccumulative chemicals below detection limits (e.g., dredging into native sediments) and proper controls are in place to minimize resuspension of bioaccumulative chemicals during dredging, bioaccumulation testing need not be conducted."

Figure 9. Delete footnote 2 that states "Subject to small project exemptions."

Page 9-7, third paragraph. Delete the sentence "Therefore, the no-test volumes for small dredging projects, as defined in Table 5-3, will also apply to bioaccumulation evaluations." The Service does not agree that this policy is based on sound science and will be protective of listed species.

Page 9.5.2. Add the sentence "A gastropod test may be recommended for areas where threatened, endangered, or candidate species of snails occur, such as in some waterways in Idaho."

Page 9-15, section 9.8.1, second paragraph. It should be noted here that use of tissue residues to determine toxicological effects is problematic and not uniformly accepted. PAHs may be the only contaminants widely accepted to have a critical residue, but only when normalized to lipid content (DiToro et al. 2000). Toxicity of other compounds, such as most metals, is related to the rate of accumulation and the rate of detoxification and excretion (as well as the pathway of accumulation), and is either based on specific tissues (e.g., gill), or on a whole-body basis. Barron et al. (2002) indicate that predicting toxicity based on tissue residues, especially when estimating chronic effects, is unreliable for many chemicals. However, using tissue residues to determine potential contaminants of concern or for long-term biomonitoring may be useful. Further discussions on this issue are needed within the RSET bioaccumulation subcommittee.

The limitations on using critical body residues should be listed here. Also, quality data for linking body residues to effect levels are quite limited for many species, in contrast to what is implied here. This section appears to be in conflict with page 9-18, third paragraph, which states "A potential difficulty with using measured residue-effects data to derive tissue BTs is data availability. There is less information available in the literature on tissue residues associated with toxicity than there is on water column or sediment concentrations associated with toxicity." The text should be revised to accurately represent the availability and quality of data on critical body residues and tissue residues associated with toxicity.

Section 9.8.1.6. Delete the sentence "The findings of these studies have provided support for the hypothesis that most water quality criteria are protective of ESA-listed aquatic species." The EPA and Service are currently in consultation reviewing the protectiveness of water quality criteria on listed species, and there is a lack of data indicating that these criteria are protective.

Section 9.8.1.6. The last sentence on page 9-21 should be revised. It currently states that "Studies with cadmium (Hansen et al. 2002a) and copper (Hansen et al. 2002b) have found that while whole body residues associated with toxicity are low, they are not as low as residues associated with toxicity in other aquatic species." However, it should also be noted that the authors specifically point out that predicting toxicity based on tissue residues is not a reasonable determinant of toxicity for many chemicals.

Section 9.8.2.4. It should be mentioned here that calculating TEQs based on TEF values to assess toxic potency of dioxin-like compounds (including planar PCBs) is the preferred method to assess impacts to wildlife species when congener data are available, as supported by EPA (2003). The TEFs for mammals and birds should be listed in this section.

Table 9.2. Identify which TEF values are listed in the table, and use the updated TEFs from van den Berg et al. (2006).

Chapter 10. No further comments.

Chapter 11.

Section 11.4. The second paragraph states that "Dredging residuals, on the other hand, may contribute to long-term bioaccumulation risk if CSs are resuspended during dredging and redeposited on the surface of the project area where they may continue to be exposed to the aquatic community after the construction work is completed." As mentioned previously, this statement is in conflict with text in the response to comments that states "Do not agree that there is significant exposure time from resuspension or that the residuals will pose bioaccumulative threat. These should be dealt with in remedial design." The COE should state in section 4 (in agreement with section 11.4) that bioaccumulation will be addressed during the proposed dredging (including when assessing the residuals) and delete the conflicting text.

Section 11.4, third paragraph. Documentation should be added as to why the SL2 values should trigger elutriate testing. The Service contends that there is no relationship between how the SL2 values are derived and predicting the need for elutriate testing. In addition, cite specific studies rather than "Regional program experience, especially at superfund sites . . . . " We are not aware of data indicating that the regional experience at Superfund sites sufficiently addresses risk to listed species.

Section 11.4.1. Cite studies that used the models and verified model inputs and outputs in field conditions.

Section 11.4.4. It should be noted here and in earlier sections of the SEF that agencies may require contingent water quality controls to better protect listed species at a site when there is high uncertainty about the potential toxicity of chemical concentrations (or to avoid or minimize potential sublethal effects) at a proposed dredge site, especially if bioaccumulative contaminants are present and the watershed has a history of elevated chemicals in tissues. Some of these control methods also could be deployed rather then chemical testing when small volumes of materials are proposed for removal.

Section 11.5.1. The Patmont and Palermo (2006) references should be made available on the RSET website, as they appear to be difficult to obtain. Also, define or provide examples of what is meant by "problematic field conditions."

Chapter 12. No further comments.

Chapter 13. No further comments.

Chapter 14.

Complete the citation for "Stirling, S.K. 1995. Sampling and Testing Cost Relief for small Projects Undergoing"

Change the journal titles to be consistent: some are italicized and others are not.

Data used to support a substantial amount of the SEF are not from peer-reviewed sources, and much of this literature is difficult to obtain or otherwise is not readily available to agencies or the public. Since the reliability of the SEF is dependent on the quality of this cited literature, many of the references should be provided in full on the website that eventually hosts the SEF. At a minimum, the following references should be posted in their entirety (or links to the entire document should be listed) on the SEF website:

Bragdon-Cook, K. 1993. Recommended Methods for Measuring TOC in Sediments. Clarification Paper presented at Sediment Management Annual Review Meeting, Puget Sound Dredged Disposal Analysis Program

DMMP (Dredge Material Management Program). 2000. Clarifications to the DMMP Bioaccumulation Protocol. Prepared by David R. Kendall (U.S. Army Corps of Engineers) and Russ McMillan (Department of Ecology) for the DMMP/SMS agencies.

EPA. 1989b. Record of Decision for Commencement Bay Nearshore/Tideflats CERCLA Site. September 30, 1989.

EPA/Corps (U.S. Army Corps of Engineers). 2004. Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework. EPA 842-B-92-008. Revised May 2004.

EPA/Corps. 1988. PSDDA Report: Evaluation Procedures Technical Appendix – Phase I (Central Puget Sound). June 1988.

Exponent. 1998. Review of Bioaccumulation Methods for Fish and Shellfish. Bellevue, Washington. Prepared for Washington State Department of Ecology, Olympia, Washington.

Fox, D. 1993. Reference Sediment Performance Analysis. Clarification paper prepared for PSDDA agencies for Annual Review Meeting, Puget Sound Dredged Disposal Analysis Program.

Hoffman, E. 2005. The Technical Basis for Revisions to the DMMP's BCoC List (in preparation). EPA Region 10, Seattle, WA.

Hoffman, E. 1998. Tributyltin Analysis: Clarification of Interstitial Water Extraction and Analysis Methods – Interim. DMMP Clarification Paper and SMS Technical Information Memorandum. December 22, 1998.

Kendall, D.R., 1990. *Reduced Testing Requirements for Small Projects Above "No Test" Volume: Biological Testing Requirements for Nondispersive Disposal Sites,* Second PSDDA annual review meeting minutes.

Management Plan Report, Phase II. 1989. Management Plan Report: Unconfined Openwater Disposal of Dredged Material, Phase II. Prepared by the U.S. Army Corps of Engineers, Seattle District; U.S. Environmental Protection Agency, Region 10; and Washington State Departments of Ecology and Natural Resources.

Michelsen, T. and K. Bragdon-Cook. 1992. Organic Carbon Normalization of Data; Technical Information Memorandum. Washington State Department of Ecology.

Michelsen, T., T.C. Shaw, and S. Stirling. 1996. Testing, Reporting, and Evaluation of

Tributyltin Data in PSDDA and SMS Programs. Puget Sound Dredged Disposal Analysis (PSDDA) Issue Paper and Sediment Management Standards (SMS) Technical Information Memorandum. October 1996.

ODEQ (Oregon Department of Environmental Quality). 1997. Field Sampling Reference Guide, Revision 5.0. Portland, OR.

Palermo, M.R., J.E. Clausner, M.P. Rollings, G.L. Williams, T.E. Myers, T.J. Fredette, R.E. Randall. 1998. Guidance for Subaqueous Dredged Material Capping. June 1998.

Patmont, C., and M. Palermo. 2006. Dredging Residuals Overview. Presented at the 4 Rs Dredging Workshop, Vicksburg, MS. April 25 to 27, 2006.

PIANC (Permanent International Association of Navigation Congresses). 1990. "Management of Dredged Material from Inland Waterways," Report of Working Group No. 7 of the Permanent Technical Committee I, Supplement to Bulletin No. 70, General Secretariat of PIANC, Brussels, Belgium.

PSDDA (Puget Sound Dredged Disposal Analysis). 1988. Evaluation Procedures Technical Appendix – Phase I (Central Puget Sound). Puget Sound Dredged Disposal Analysis, U.S. Army Corps of Engineers, Seattle District. Seattle, Washington.

PSEP (Puget Sound Estuary Program). 1996. Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound Estuary Program. Prepared for the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, Seattle District. January 1996.

PSEP. 1995. Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments. Prepared by Washington Department of Ecology for U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Seattle, Washington and Puget Sound Water Quality Authority, Olympia, Washington.

PSEP. 1988. 1988 Update and Evaluation of Puget Sound AET. U.S. Environmental Protection Agency and Puget Sound Estuary Program. Seattle, WA.

PSWQAT (Puget Sound Water Quality Action Team). 1997a. Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Puget Sound Water Quality Action Team. Prepared for U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

PSWQAT. 1997b. Recommended Guidelines for Measuring Metals in Puget Sound Water, Sediment, and Tissue Samples. Puget Sound Water Quality Action Team. Prepared for US Environmental Protection Agency, Region 10, Seattle, Washington.

PSWQAT. 1997c. Recommended Guidelines for Measuring Organic Compounds in Puget Sound Water, Sediment, and Tissue Samples. Puget Sound Water Quality Action Team. Prepared for U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

PTI (PTI Environmental Services). 1995. Analysis of BSAF Values for Nonpolar Organic Compounds in Finfish and Shellfish. PTI Environmental Services, Bellevue, Washington. Prepared for Washington Department of Ecology, Olympia, Washington.

Steering Committee of the 4 Rs Dredging Workshop. 2006. Resuspension, Release, Residual, and Risk (the "4 Rs"). Vicksburg, MS. April 25 to 27, 2006.

Stirling, S.K. 1995. Sampling and Testing Cost Relief for Small Projects Undergoing

Appendix C.

RSET issue paper #5 "TEF methods for wildlife." It states here that "The EPA draft wildlife TEFs have only been recently developed and there are still considerable uncertainties in their application in ecological risk assessment" and "RSET can possibly present these approaches in an appendix with a discussion of uncertainties, but wildlife TEFs are still a few years from being ready for general use." These statements do not represent the consensus within the RSET bioaccumulation subcommittee and are in direct conflict with recommendations made by EPA in their 1998 "*Workshop Report on the Application of 2,3,7,8-TCDD Toxicity Equivalence Factors to Fish and Wildlife*" (available at http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=23763) which specifically concludes that:

- "The toxicity equivalence methodology is technically appropriate for evaluating risks to fish, birds, and mammals.

- The toxicity equivalence methodology reduces uncertainties and is less likely to underestimate risks than are methods based on a single compound (e.g., 2,3,7,8-TCDD) or a class of compounds (e.g., total PCBs).

- The planning committee concluded that the results of the workshop support the use of the toxicity equivalence methodology in ecological risk assessment. The committee also suggested the development of additional tools and data to improve the methodology's implementation."

Wildlife TEFs have been used to assess dioxin-like activity and assess risk for mammals and birds in a number of peer-reviewed publications since the early 1990s, and recommended TEF values for birds and mammals were published by van den Berg et al. (1998). The EPA (2003) supports the use of TEFs to calculate TEQs to assess dioxin-like activity and concludes that "In the specific case of assessment of PCBs, a congener-specific approach, including the toxicity equivalence methodology, is more accurate than either an Aroclor- or homolog-based approach for a number of reasons." Assessing risk to birds and mammals from dioxin-like compounds is the preferred method over an Aroclor or total PCB method, especially when analyzing risk to mink and fish-eating bird reproduction, and these published methods should be adopted by RSET.

Thank you for the opportunity to comment on the framework document. Please contact Jeremy Buck at 503-231-6179 if you have any questions regarding these comments.

Sincerely,

Monty Knudsen

for Kemper M. McMaster
State Supervisor

cc:
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Gary Burton and Michael Morse, Snake River Fish and Wildlife Office, Boise, Idaho

Literature Cited

Barron, M.G., J.A. Hansen, and J. Lipton. 2002. Association between contaminant residues and effects in aquatic organisms. Reviews of Environmental Contamination and Toxicology 173:1-37.

DiToro, D.M., J.A. McGrath, and D.J. Hansen. 2000. Technical basis for narcotic chemicals and polycyclic aromatic hydrocarbon criteria. I. Water and Tissue. Environmental Toxicology and Chemistry 19:1951-1970.

EPA. 2003. Framework for application of the toxicity equivalence methodology for polychlorinated dioxins, furans, and biphenyls in ecological risk assessment. External Review Draft. EPA/630/P-03/002A. June 2003.

Johnson, L.L., T.K. Collier, and J.E. Stein. 2002. An analysis in support of sediment quality thresholds for polycyclic aromatic hydrocarbons (PAHs) to protect estuarine fish. Aquatic Conservation-Marine and Freshwater Ecosystems 12(5):517-538.

van den Berg, M., L. Birnbaum, A.T.C. Bosveld, B. Brunstrom, P. Cook, M. Feeley, J.P. Giesy, A. Hanberg, R. Hasegawa, S.W. Kennedy, T. Kubiak, J.C. Larsen, F.X.R. van Leeuwen, A.K.D. Liem, C. Nolt, R.E. Peterson, L. Poellinger, S. Safe, D. Schrenk, D. Tillitt, M. Tysklind, M. Younes, F. Waern, and T. Zacharewski. 1998. Toxic equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environmental Health Perspectives 106(12):775-792.

van den Berg, M., L.S. Birnbaum, M. Denison, M. De Vito, W. Farland, M. Feeley, H. Fiedler, H. Hakansson, A. Hanberg, L. Haws, M. Rose, S. Safe, D. Schrenk, C. Tohyama, A. Tritscher, J. Tuomisto, M. Tysklind, N. Walker, and R.E. Peterson. 2006. The 2005 World Health Organization reevaluation of human and mammalian toxic equivalency factors for dioxins and dioxin-like compounds. Toxicological Sciences 93(2):223-241.

Wenning, R.J. and C.G. Ingersoll. 2002. Summary of the SETAC Pellston Workshop on use of sediment quality guidelines and related tools for the assessment of contaminated sediments. 17-22 August, Fairmont, Montana. Society of Environmental Toxicology and Chemistry. Pensacola, Florida.